Local wood (biomolecules) valorisation through the characterization and industrial production of Robinetin, a yellowish fluorescent colorant

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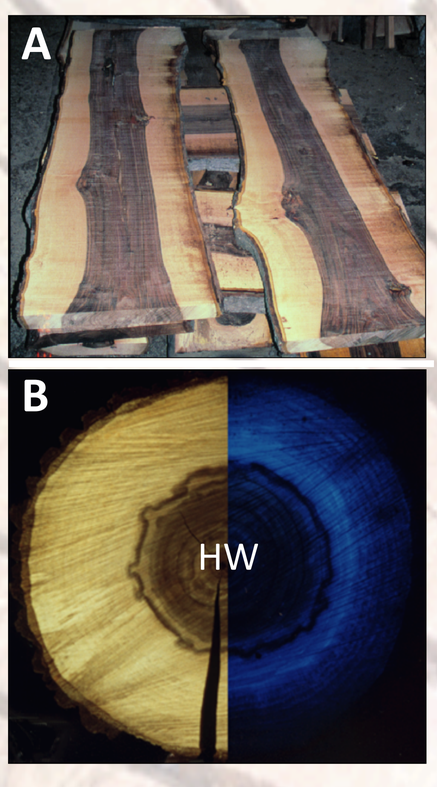
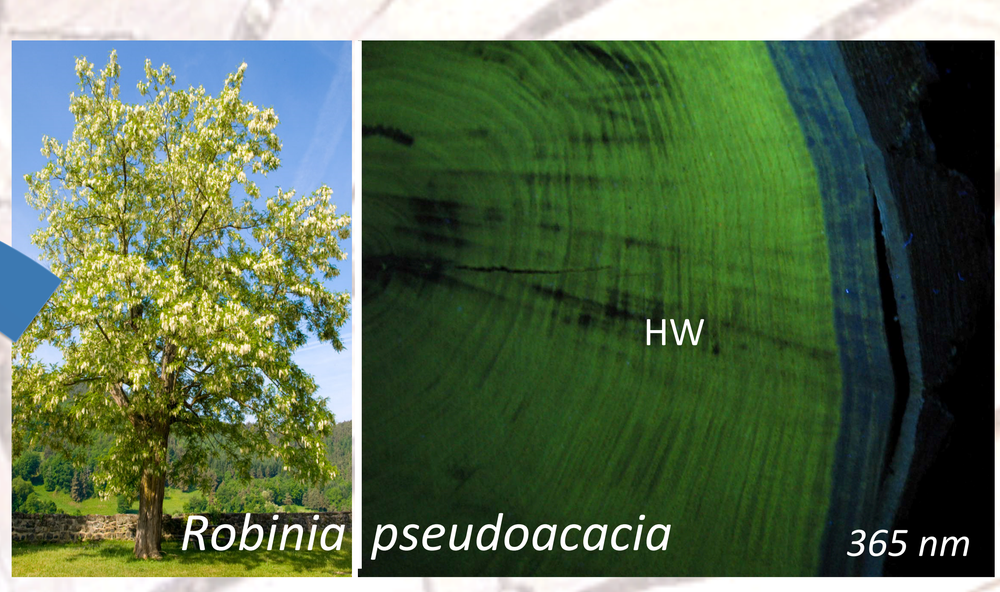


Figure 1 : Accumulation of phenolic compounds within the heartwood (HW) of black walnut (*J. nigra*). A) Walnut tree trunks processed for furniture making. B) U.V. exposure revealing fluorescent compounds specifically synthetized at the sapwood-heartwood transition zone.

INTRODUCTION

Due to their size and diversity, **trees** represent important sources of biomass. Interestingly, **heartwood** formation (corresponding to the final step of wood differentiation occurring within the trunk of many tree species) is often associated with **the accumulation of specific phenolic extractives** that will affect wood color and durability (Figure 1 and references). Many **biomolecules** of interest could thus be extracted from wood and provide supplementary outcomes for the timber industry.

The ValRob project aims at finding new uses for wood resources available at the regional or national levels. As a proof of concept, our project focused on a **fluorescent molecule** that accumulates in great quantity within the heartwood of **black locust (*Robinia pseudoacacia)***.

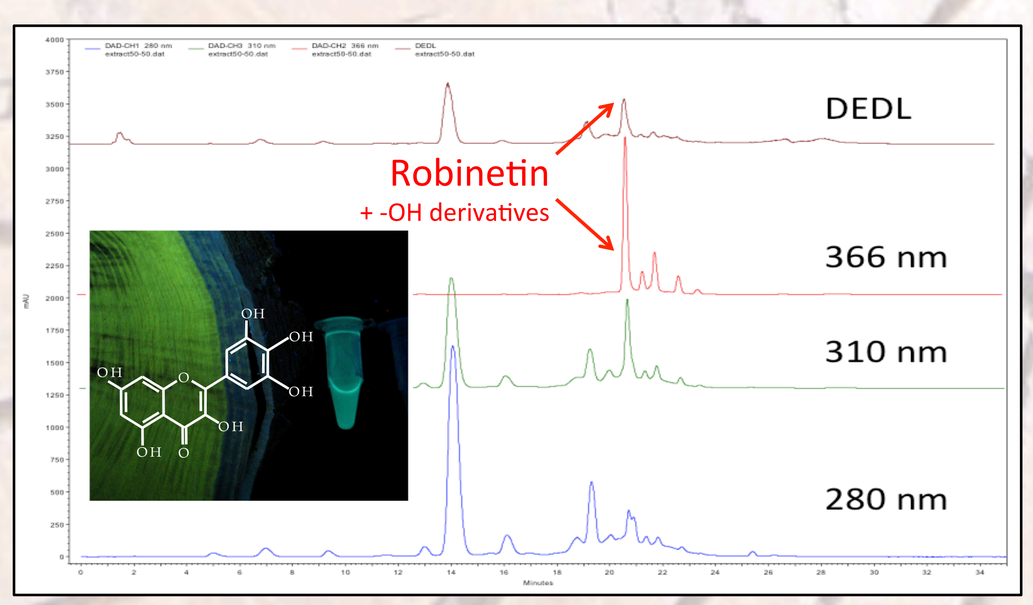


ValRob Project :

Cosmetic valorisation of *Robinia* wood extracts and biomolecules

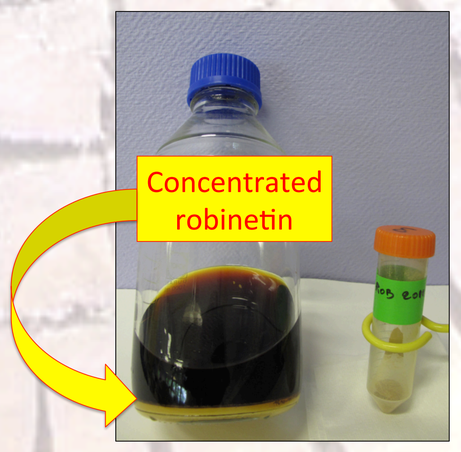
1) IDENTIFICATION OF THE FLUORESCENT MOLECULE

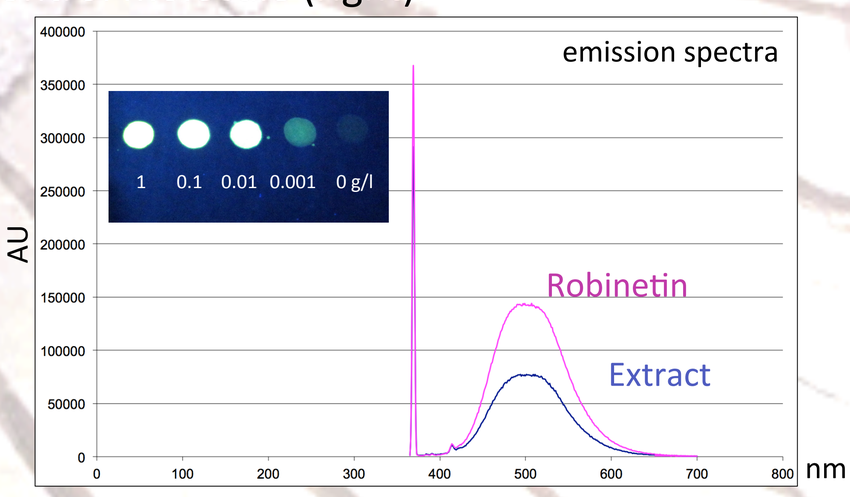
Robinia wood extracts were analyzed by **HPLC-DAD-DEDL**. The main compound showing a specific response under 366nm incidence was further purified and shown to be Robinetin by mass spectrometry.



2) EXTRACTION OPTIMIZATION AND SCALING-UP

Different aspects of the extraction process (wood particule size, wood/solvant ratios, temperature, extraction time) were optimized. A first pilot extraction was realized at the laboratory level with 3,2 kg of wood. 121g of extract (dw) **enriched in robinetin (13%)** was obtained (left). This extract was higly fluorescent and showed the same emission spectra under U.V. exposure than the control molecule (right).





CONCLUSIONS

A first transfer of the extraction process has been realized at **Alban Müller International**. The extracts obtained contained 17 to 22% of robinetin (dw). These extracts will allow us to evaluate their properties and possible uses in cosmetic formulations.

Beyond cosmetic, several applications can already be foreseen in many areas using this natural fluorescent colorant through surface treatments (vernishing or spraying) or impregnation (paper, cloth,…). Wood or wood powder can also be directly used, providing in the box (formulations) and out of the box perspectives of use (packaging, store decoration).

Beritognolo et al. (2002) Tree Physiology 22: 291-300; Burtin et al. (1998) Trees-Structure and Function 12: 258-264; Magel et al. (1994) Trees-Structure and Function 8: 165-171.